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The University of Toronto Medical Journal

VOL. II NOVEMBER, 1924 No. 1

EDITORIAL

BY WAY OF INTRODUCTION

WE present this the first issue of the MEDICAL JOURNAL with the confident hope that the success which the JOURNAL won last year will again be achieved. It was a source of pride to those who guided the progress of the JOURNAL during its first experimental year that it was so well received, both by the undergraduate students of this university and by those of other schools.

It will be the policy of the present editorial board to make the JOURNAL a more effective medium for student expression than heretofore. We feel that success rests alone on such a policy, and we have faith that we shall be able to encourage in the students a more articulate spirit. It is manifestly not possible to publish a JOURNAL of purely staff contributions, nor do we believe it advisable to make it a medium for student expression alone. Only in the wise combination of the two can a secure future be assured for the JOURNAL. It is only by having a wealth of material from which to select that a high standard of excellence can be maintained; consequently, we urge our promising undergraduate contemporaries to put pen to paper and write.

From the staff we beg help and co-operation. Only by the presence of names of maturity and authority in our tables of contents can we offer sufficient excellence to our readers. May the staff men not withhold their aid, but rather assist us toward a solid diet of medical literary food. We wish to thank those members of the staff whose help last year very materially assisted in setting the JOURNAL on its feet. In asking for a continuance of their aid, we would also suggest to the others, "Go thou and do likewise."

SOMETHING CANADIAN MEDICAL STUDENTS NEED

FOR some years past it has been the custom of the British Medical Journal and the London Lancet to publish a Students' Number each year, in which are discussed such questions as the regulations of the profession, the cost of medical education, financial and social considerations, the facilities offered by various hospitals and medical schools, and details of post-graduate work of special interest to final year men.

The "Educational Number" of the British Medical Journal was published this year for the session 1924-25 on September 6th. The

"Students' Number" of the London Lancet was published on August 30th. Both these magazines may be seen in the library of the Medical Building and will be very interesting and valuable to any students who are thinking of taking post-graduate work in England, Scotland or Ireland.

The American Medical Association issues each year a bulletin, listing the hospitals approved for internships, and giving full tabulated information about each. The information given includes the name and location of the hospital, the number of beds on each service, the number of internes, whether these are appointed with or without examination, details of services offered, and salary attached. The bulletin has a section on General Hospitals, a section on Hospitals for the Insane and a section on Special Hospitals. It may be secured by writing to the Journal of the American Medical Association, 535 North Dearborn St., Chicago, and enclosing 10 cents.

The Canadian Medical Association has not yet seen fit to provide this service for Canadian students, possibly because they have been so intent on raising the standards to which the student must comply before being allowed to practise. Nevertheless, the graduating year would appreciate such a service as this, especially if it were to include a survey of the opportunities in private practice.

There is no denying that the need for information of this sort exists, and the Canadian Medical Association is the only organization to which the student may turn for it. Surely it is not too much to ask.

THE NATURE OF ANGINA PECTORIS

THE essential nature of angina pectoris has long been the subject of much speculation, and the plethora of theories on the subject is equalled only by the scarcity of definite facts. Sclerosis of the coronary arteries, or their spasm, exhaustion of the heart muscle from various causes, and stretching of the arch of the aorta are some of the explanations offered. Difficulty comes from the fact that the pathological findings in angina pectoris are inconstant, frequently no evident heart lesion being discernible which can be blamed for the condition. Considering these facts, one is led to think of angina pectoris as a symptom which may be produced in a variety of ways, all of which, however, involve the placing of a burden on the heart too great for it to carry.

Recently Reid[1] has offered a theory in explanation of angina which would account for the condition, in part, at least, by a functional disturbance. According to Reid's argument, there is normally, during exercise, a dilatation of the peripheral blood vessels, which is effected in all probability, by a nervous reflex—either directly vaso-dilator or inhibitory to the vaso-constrictor tone. This results in increased blood flow through the part affected, and consequently affords increased drainage from the heart, which is thus able to function without excessive strain. Reid thinks that certain conditions may produce a failure of this depressor mechanism, so that at moments of increased activity the heart may find itself working against an excessive peripheral resistance,

[1]Reid, W. D., The mechanism of Angina Pectoris, Arch. Int. Med. 34: 147. Aug. 1924.

with high aortic and left ventricular pressure. Pain then results by stimulation of visceral afferent nerve endings in the heart, and is referred to the left breast, arm, etc.

The theory is attractive in that it does not exclude the possible co-operation of coronary sclerosis or aortitis in producing the condition, while it offers an explanation of those cases where no considerable heart lesion can be found. We should bear in mind, however, that the explanation is as yet hypothetical. It is known that pallor of the face and extremities frequently accompanies attacks, while the blood pressure is usually raised.[2] The beneficial effects of the use of vaso-dilators in angina pectoris are well known and fit in well with the theory. Clinical work aimed at measuring the blood flow in muscle during an attack will aid in testing the truth of the hypothesis.

[2]Osler: Principles and Practice of Medicine. 9th ed. 831

PSYCHIATRISTS IN COURT

REGARDLESS of what we as individual medical men may have thought of the issue of the recent murder trial in Chicago, all of us must deplore the role enacted by medical witnesses at the trial. Expert witnesses were employed to testify on opposite sides of the case. Each was employed in the beginning with the understanding that his opinion should support one particular side. And the opinions of these alienists have been set down in the court records, those of one side directly contradicting those of the other.

Men with psychiatric training can understand how variant opinions may be held in such a type of case. But one can also understand the cynicism of the layman who sees scientific men employed beforehand to arrive at contradictory conclusions. Such a condition of affairs can serve only to bring medicine and the science of psychiatry into disrepute.

Most of us feel that these things ought not to be so. Whether the Chicago murderers were of psychopathic mentality should have been decided by an impartial board of investigation whose verdict should have been quite unrestricted. A difference of opinion under these conditions would not have caused lips to smile and shoulders to shrug. Undoubtedly it would be better in such cases for the court to refuse partisan expert testimony, and to accept only the opinions of men appointed by the court, who are not to be paid for a stipulated diagnosis.

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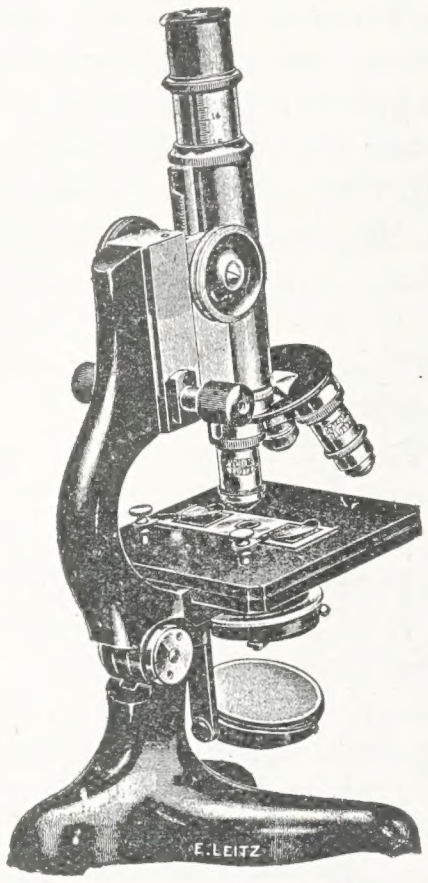

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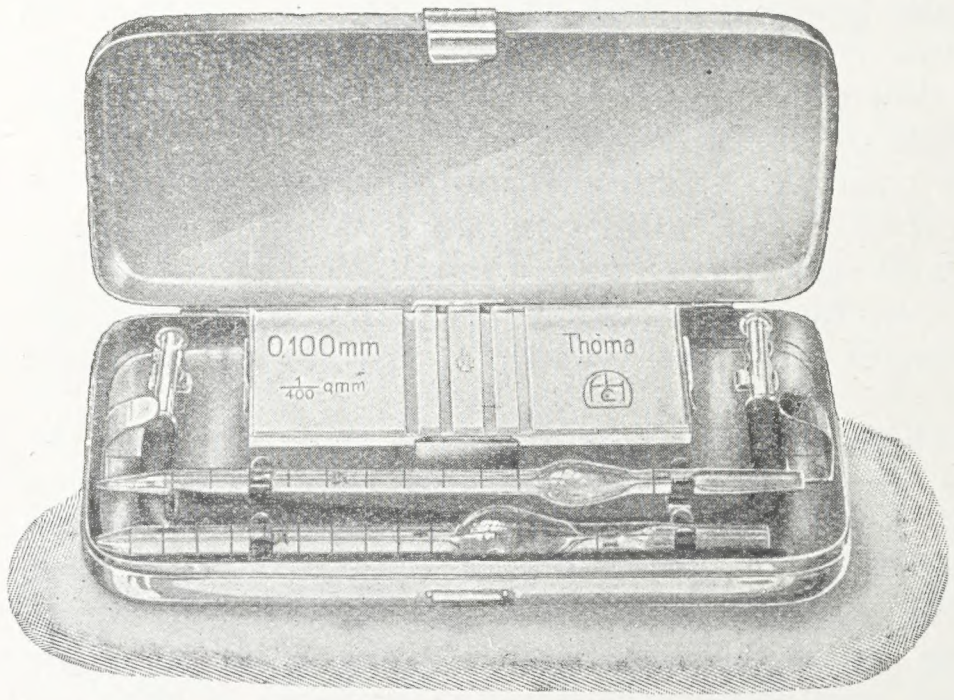

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SOME PRINCIPLES IN THE TREATMENT OF BRIGHT'S DISEASE

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Bright's Disease is a diffuse process in the kidneys involving, in varying degrees, the capillary tufts, the epithelium of the tubules, and the interstitial tissue. The term "Bright's Disease" does not include the two other types of pictures in which the kidney plays a part, important but not primary, namely, poisoning by the metals, especially mercury and arsenic; and secondly, the toxic condition sometimes seen in pregnancy, called eclampsia.

One great cause underlies Bright's Disease, namely, *bacterial infection*. While the so-called acute infectious diseases are not as yet, except in the case of scarlet fever, definitely proved to be of bacterial origin, yet opinion is so strong to this effect that they may be included under this head. Causes of nephritis given in the older textbooks, such as exposure to cold, alcoholism and the like, are now felt to be operative only in association with co-existing bacterial infection. While it is true that many cases presenting themselves first in chronic form cannot be always easily related to bacteria the thought must arise that they may be late manifestations of a very mild infection of years before, or the expression of some area of infection existing still.

It follows then that the fundamental part of the treatment of nephritis is to search most thoroughly for any source of bacterial activity and to deal with such as effectively as practicable. Moreover, in connection with chronic nephritis, the reflection must arise that if a more careful watch were kept on the urine during the course, and particularly the convalescence, of infections of any sort, however mild, management at this time might prevent future trouble.

Of the infections, the ones most commonly seen to be followed by nephritis are those which attack the upper respiratory passages, and included here are "colds", septic conditions of the teeth and inflammation of the paranasal sinuses. There is one focus of infection which, statistically, stands out above all others. This is *the tonsil*. There is no doubt that a great advance has been made in the recognition of tonsillitis in relation to nephritis, and it is now often considered wise to remove actively unhealthy tonsils just as early in the course of an acute nephritis as the patient's condition will possibly permit.

Another great advance has been made in the treatment, and also in the prognosis of nephritis, by studies of the functioning of the kidney in the individual case. The kidney normally eliminates nearly all of the nitrogen, most of the inorganic salts, and sixty per cent. of the water, which the body gets rid of daily. In disease it may or may not be able to perform one or all of these functions efficiently. If it is not, whichever of the waste products is not adequately eliminated will accumulate in the body and do harm. By ascertaining its ability to secrete nitrogen, sodium chloride and water it is possible to so apply a knowledge of dietetics as to spare the diseased kidney in its work and to protect the body from retention of waste.

So-called functional tests have been devised which give information of a very practical nature. Of these, three are so useful and so simple of application, requiring neither technical skill nor laboratory apparatus, that they will be described in detail:

The Two Hour Test.—Seven four ounce bottles are required. The patient's regular habits are not modified for the test. Every two hours through the day the bladder is emptied, the amount is noted, and a specimen is obtained. From three hours after the evening meal until breakfast next morning the total amount is collected, the quantity measured and a specimen is saved. If this simple procedure is adopted in the case of a normal person the following observations will be made: The samples closer to the meals will be larger in quantity and lower in specific gravity than the ones four hours after the meal, provided no fluid has been taken between the two specimens; the night specimen will average 400 c.c. (30 c.c. to one ounce) in the majority of individuals, and will have a specific gravity of 1018 or thereabouts; the variations in the specific gravity of the seven different specimens will be from seven to ten points and one specimen at least should be 1020.

The interpretation is that the water available for excretion by the kidney comes through early after a meal, whereas the nitrogen is at its height of excretion in the later specimen and the kidney is able to secrete it in a high concentration. The night quantity will, under ordinary conditions, be just enough to fill the bladder by morning so that the individual will not have to arise during the night. There will be just enough nitrogen left over from the day's activities to bring the specific gravity of the night quantity to about 1018. Thus it will be seen that the kidney is able to do its work in response to meals and to provide itself with a rest period at night.

The Water Test.—The patient empties the bladder and during half an hour drinks 1500 c.c. (50 oz.) of water. In four hours the greater part of this total quantity should be secreted, and the greater part of the four hour quantity should be secreted in the first two hours. This test, of course, is not safe to apply just after the disappearance of edema.

The Concentration Test.—The patient is directed to abstain from fluids to the greatest possible extent from four p.m. one day until four p.m. the next day. During this period the meals should contain a goodly quantity of protein and be of as dry materials as possible—lima beans, pancakes, eggs, meat, etc. By the afternoon of the second day the specific gravity should be 1028 or more.

From these simple procedures some very interesting observations may be made. For instance, it may be found that in a mild case of acute nephritis or in a chronic case with, let us say, the findings of: (1) albumin in the urine; (2) microscopic elements—tube casts, a few red blood cells, a few white blood cells; (3) some degree of high blood pressure; (4) some enlargement of the heart; the two hour test gives an average result. If this is normal we may then test the reserve power to handle nitrogen through the concentration test. If this too is normal we have a class of case we may style *nephritis with efficiency of functioning.* It would be a serious error to modify this individual's intake of nitrogen. For the human animal is a mixed feeder. It is considered that vegetable protein "needs to be built up in the ox" for human consumption. Deprivation of flesh food leads to a lowering of vigour and cutting down of

total protein requires a quieter life. Thus a patient who needs no such restrictions, even though he has the evidences of kidney damage, may be confidently spared the invalid's regime and gloomy prognosis which has so often been imposed on such in the past by want of any precise knowledge on the part of the physician.

On the other hand, it may be found in such a case that, whilst the two hour test gives a specific gravity reading of 1020, the concentration test will not show a reading much, if any, higher. In such a case the protein intake should be limited to the middle range.

Again, it may be found that there is narrowing of the range of specific gravities in the two hour test, at first always in the higher levels. This tendency to fixation of specific gravity, which in a badly failing case eventually includes the power to pass a dilute urine as well as a concentrated one, indicates a retention of waste product nitrogen in the body. Early in such a failing case, this nitrogen lag will express itself in an *even* secretion throughout the twenty-four hours, and there will be, therefore, the need for the patient to arise to void urine once, and later more often, during the night. This phenomenon is called, variously, *nycturia*, *nocturia*, and when there is thirst and the drinking and secretion of large quantities of water there is then said to be *nocturnal polyuria*. The badly diseased kidney eventually loses all power to do its work in response to the stimulus of meals so that the quantity of the night urine rises in proportion to the day urine. Eventually the quantity at night may exceed that passed in the day time, so great may be the lag. Conversely, in a patient presenting himself quite ill, who has evidence of chronic nephritis, without edema, *and who does not have nocturia*, a search elsewhere than in the kidney function should be made for the cause of the condition. An observance of this simple point will save much confusion.

The water test has two aspects. When a surprising rapidity of response to the water ingested occurs, such as happens in patients recovering from an acute nephritis, it is probable that the kidney is irritable to water alone. Persistence in crowding such a case with fluids in an effort to promote elimination of other products will probably result in fatigue of the kidney, and may be followed by retention of water as a result. When, however, there is a lag in water secretion the interpretation is more complicated. It has been found that when salt is retained in the body water is almost invariably retained as well, presumably to keep the concentration of the soda within physiological limits. A delayed water secretion, therefore, may represent an inability of the kidney to secrete either water or salt. The estimation of the behaviour of sodium chloride in the body is very complicated. For practical purposes, therefore, we must link the retention of water with the retention of salt. A case of nephritis showing some dropsy must be limited in the intake of both salt and water. So also a case giving a somewhat slow response to the water test, even in the absence of edema, must be restricted appropriately in the intake of these two materials.

There are three other functional tests available which have the advantage of giving their results more quickly and with less trouble to the patient. They all require either apparatus or special skill.

The simplest of these is *Maclean's test.* In this, 15 grams of urea are given by mouth in 100 c.c. of water. The patient empties the bladder before the test and at one and two hours afterwards. Provided

there is no diuresis going on in the patient, for any reason, one of the specimens obtained after the urea should show a urea percentage of two or over in a normal case. Maclean holds that this test will show a deficiency in nitrogen elimination on the part of the kidney even when this is not sufficient to be associated with retention of nitrogen abnormally in the blood. The urea in this test is estimated by the hypobromite method.

The *phenolphthalein test* consists in giving a minute amount of this pigment hypodermically together with 500 c.c. of water by mouth. The urine is collected at the one hour and two hour interval, diluted with water; soda solution is added and the depth of colour read in a colorimeter. The percentages of elimination should be 40 to 60 for the first hour and 20 to 40 for the second.

The estimation of the waste nitrogen, or end products of protein metabolism in the circulating blood, is work requiring technical skill of a high order. The tests in common use here are those for the total non-protein nitrogen, or for one or other of its components—urea nitrogen and creatinin. It must be emphasized, however, that excepting the speed with which accurate information may be obtained, there are few advantages possessed by these tests over the simple studies of specific gravity already described. In the occasional situation in which such advantage occurs the information furnished by the blood work can usually be foretold, more or less, by the general observation of the patient's condition. The upper limits of the normal variation of these nitrogen values are, per 100 c.c. of blood: total N.P.N., 60 mg.; urea nitrogen, 30 mg. in the young to 40 mg. in the old; creatinin 2.5 mg.

By means of these tests the important part of the management of Bright's Disease—the dietary—can be administered with much satisfaction. To apply intelligently the information that may thus be obtained one must have regard to the amount of fluids to be given, must have some knowledge of the amount of protein and sodium chloride contained in the commoner food stuffs, must understand the principle of sparing protein burning in the body by the free use of carbohydrates in the diet, and must have an eye to the total caloric value of the diet prescribed.

Dietary principles in nephritis.—The tests for the functional efficiency of the kidney classify cases of nephritis, for purposes of dieting, into three main groups:

(*a*) Cases with perfect elimination of nitrogen, salt and water. This group includes only chronic nephritis.

(*b*) Cases with partially limited capacity to secrete either salt and water, or nitrogen, or both. This group includes mild cases of acute nephritis, cases recovering from severe nephritis, sub-chronic cases and chronic cases gradually failing.

(*c*) Cases with severe failure of secretory capacity. Here is included severe cases of acute nephritis and end stages of chronic nephritis.

In cases of severe failure there is often suppression of urine for some hours. Hot poultices, sweats, purgation and hot colon irrigations may or may not avail. While trying in these ways to remove waste products and water from the system, it is probably wise to give from twenty to thirty ounces of fluid per twenty-four hours by mouth. If there is a

returning secretion this fluid should be in the form of nourishment, in part at least. The body wear and tear is going on and during starvation some forty to fifty ounces of tissue protein is broken down daily. This must necessarily result in loss of strength, but, in addition, as the kidneys are not doing their work, this nitrogen accumulates in the blood and body juices. Whatever the cause may be of the toxic manifestation of nephritis called uraemia, nitrogen retention is related to it. By making use of the principle that carbohydrates spare the burning of protein in the body, it is possible by giving the latter to reduce the breaking down of protein to 25 grams. This amount should be replaced by feeding.

Patients suffering from these severe phases of nephritis are very ill and require the simplest form of nourishment—milk is usually turned to, and 20 ounces of milk (30 c.c. to the ounce) will provide over 20 grams of protein. But milk is very low in total caloric value. If cream be substituted there will be the same percentage of protein and every gram of fat will give 9 calories, where a gram of protein yields only 4 calories. Thus a pint of 20 per cent. cream contains over 1000 calories. Cream may be diluted with milk, water or seltzer. To obtain a high carbohydrate value in order to spare the protein catabolism, sugar of milk is very useful, as it is not as sweet as cane sugar and may be used much more freely. It is well tolerated in severe illness. Each ounce of sugar (30 grams) will give 120 calories.

As soon as the digestion will permit, the total caloric value may be brought up by any sweet foods, fruits, and low grade vegetables prepared without salt. As the percentage of protein is very low in all these it may be disregarded.

It is undesirable to keep the protein intake below at least 50 grams for more than a week or ten days. If the condition of the patient is improving either more milk or cream, or eggs (6 to 7 grams protein each), and cereals such as bread, may be added. A liberal carbohydrate diet with the higher-grade substances, bread and potatoes, contains about 20 grams per day of protein.

In acute nephritis recovery is often fairly rapid. It is then desirable to increase the protein intake to 70 or 80 grams. The safety of this will be shown by the concentration test, and often this test will show a specific gravity of well over 1020 when none of the routine specimens have recahed this point. There is then no objection to the introduction of some flesh food. An ounce and a third of roast beef, beef steak or roast veal will give 10 grams of protein.

Before the knowledge we now have was available there was a strong prejudice against the use of the more complicated forms of protein. Consequently milk was slavishly adhered to, and as a patient's appetite returned it was met by increasing quantities of this apparently safe and simple food. Milk is so low in caloric value, however, that to obtain sufficient nourishment in total calories some two to three quarts would be required. This would contain too large an amount of protein. Moreover, in severe cases the amount of fluid and salt intake should be in accordance with the presence of edema on the one hand, or the findings of the water test on the other, and as a quart of milk contains all the salt (2 gms.) required by the body per day, it is obvious that milk can be quite a dangerous article in nephritis.

The cases with partially limited capacity, as detected by the func-

tional tests, may be handled according to the plan just outlined for a recovering acute nephritis. The protein should be set at a level of 50 or 60 grams if the concentration test is not good. If the water test is not normal fluids should be limited and the salt intake modified. Amongst salty foods, gravies and meat soups are high in content.

Cases of chronic nephritis with good efficiency should be tested at intervals. Some of these cases, however, remain stationary for many years. And, as they are often first discovered by chance, as during an examination for insurance or a routine examination, it is very gratifying to be able, with the aid of the functional tests, to reassure them.

PREGNANCY AND PULMONARY TUBERCULOSIS

Thirty-eight patients had, after recognition of their tuberculosis, 50 children. Five of them are dead. In 27 the disease was recognized and treated before pregnancy, and in the majority before marriage. These 27 had 39 children. Sixteen were early, 4 moderately advanced and 7 far advanced cases. Of these 27 two died (7 per cent.), 1 about 3 months the other about 1 year after delivery. The former, a far advanced case, became pregnant about 4 years after treatment. The latter, an early case, about one year after. The remaining 25 are apparently as well as before pregnancy, though 3 have had 3 children and 6 have had 2 children. The pregnancies occurred 1 to 12 years after treatment, the average being 4 years.

In 11 the disease was recognized during pregnancy, one being early, 5 moderately advanced, and 5 far advanced. Of these 11 three died (27 per cent.), one of these three being first seen 5 days before delivery, 1 twelve days, and 1 two months. All three were far advanced. Of the remaining 8, two far advanced cases, seen for the first time at the 5th month are still under treatment. One was primipara, the other a sextipara; the latter from her history having had tuberculosis even before the birth of her first child. The remaining six came through successfully and are still alive after periods of time varying from 3 months to 13 years, the average being 2 years.

Conclusions drawn:

(1) Active cases of tuberculosis should be advised against marriage.

(2) Quiescent cases, especially after treatment and education, bear the duties of marriage sufficiently successfully that they may be allowed to marry if they wish.

(3) Quiescent cases becoming pregnant, if put on a rigid regime, may be expected to come through the pregnancy with but little, if any, advance of the tuberculosis.

(4) Active cases becoming pregnant run definite risk, yet the operations for abortion have a mortality making the continuation of the pregnancy more desirable.

"Pregnancy in Cases of Tuberculosis of Lungs". J. Walsh in A.J. of Obst. and Dis. of Women and Children. Feb., 1918. Abstracted in A.R. of T. Nov., 1918.

ON THE STATE CONTROL OF PREVENTIVE MEDICINE

T. H. Belt, '28

"The first duty of medicine", says Sir George Newman, "is not to cure disease but to prevent it", and in this the medical profession has a singular attribute, namely, that it aims at forestalling the justification of its own existence.

In reviewing the march of this tendency since national governments first became zealous of the people's health, perhaps it would be well to start with the report of the Royal Sanitary Commission, appointed by the British Government in 1869, comprising the foremost physicians of the day which summarized the minimum of preventive medical measures "necessary for civilized social life" as follows:

(i) The supply of wholesome and sufficient water for drinking and washing.
(ii) The prevention of pollution of water.
(iii) The provision of sewerage and the utilization of sewage.
(iv) The regulation of streets, highways and new buildings.
(v) The healthfulness of dwellings.
(vi) The removal of nuisances and refuse and the consumption of smoke.
(vii) The inspection of food.
(viii) The suppression of causes of disease and regulations in the case of epidemics.
(ix) The provision for the burial of the dead without injury to the living.
(x) The regulation of markets, etc., public lighting of towns.
(xi) The registration of death and sickness.

In most civilized countries these measures have now reached a high degree of perfection and by the light of scientific discovery the underlying purpose has been advanced much further in restriction of employment of women and children, supervision of hazardous trades, establishment of old age pensions and health insurance,[2] regulation of the consumption of narcotics and alcohol, segregation of anti-social individuals, state intervention in the function of maternity, prophylactic treatment, medical examination and calisthenics for school children, preventive surgery and legislation dealing with tuberculosis, venereal and other prevalent diseases. Industrial hygiene, too, has done a great deal to raise national standards of salubrity. The importance of this work is indicated when one considers that approximately one-third of the people spend one-third of their lives in work-shops and factories.[2] The etiology of industrial diseases, obscure and difficult of comprehension, has been carefully studied to great advantage.

The crowning achievement of Preventive Medicine in recent years has been its victories over infectious diseases. The average expectancy of human life has extended and many formidable diseases have almost disappeared. In short, the onslaught of medicine against life's dross has succeeded in appreciably prolonging, cleansing and intensifying human existence.

Which all sounds very fine. Yet there are considerations confronting

us still that provide a measure of compensation for all this rosy chatter. It would surely be fine if the attainment of optimum health conditions involved merely the continued socialization of medicine till an equal distribution of medical benefit were established under state control; but the problem is not so easily solved. To make each individual infirmity the onus of the State is to foster mediocrity at the expense of competence, which is humane but not eugenic.

When one reflects that fecundity tends to increase in inverse proportion to the social scale[3] it is clear that such a contravention of the Law of Natural Selection augurs ill for the future of the race. particularly in view of the fact that the population keeps on increasing. Three and a half millions of Englishmen in the reign of Queen Elizabeth have yielded thirty-three and a half millions to people the same territory. The United States, which boasted five millions of citizens in 1800, gives promise of being one hundred and seventy-five millions strong within the life-time of people now living, and this notwithstanding that man no longer has a frontier; nearly all the desirable space on our planet is occupied. And superimposed upon all this is an added complication in the fact that certain constitutional diseases, notably cancer, and mental degeneracy are on the increase too.

Manifestly there must be Eugenic measures introduced into any campaign which attempts to cope with the situation. Preventive Medicine has accomplished a great deal and probably will accomplish a great deal more. There is still a serious amount of preventable disease and avoidable disablement; many persons who need medical treatment are not getting it, many who are being treated are not receiving adequate treatment. But Preventive Medicine is euthenic and is therefore necessarily limited in its scope.

The human body is seen to be a complicated organism evolved through the ages from a variety of organic and inorganic elements, developed in response to the necessity of functioning. It is an intricate physiological mechanism that will always be subject to wear through use, atrophy through disuse, damage and ultimate break down. Preventive Medicine, however far it may progress, can never obviate the necessity for curative measures. The best that can be hoped for, is its alliance with sound breeding principles to minimize infirmity.

In this connection it would seem that the task in hand generally is to bring about a rational consideration of the problem. People seem to lack the moral courage to face squarely the issue of Birth Control on the one hand and on the other they display a lamentable tolerance for healing frauds and a lack of faith in the science of medicine. Anti-vaccinationists, anti-vivisectionists are not uncommon still. One may find diabetics denouncing vivisection with the renewed vigour that insulin brings them. Themselves living testimony of the efficacy of serum therapy, it appears astounding that people can conscientiously rail against the means of their betterment.

To the lot of an enlightened minority perhaps more than to political powers falls the duty of furthering these ends. The elimination of tainted germ plasm,[4] the prevention of disease and the extension of knowledge must be a slow process, but loyally espoused and codified in the proper quarter, however small, it bids fairest for progress. For, while it is manifest that our present system presents many deficiencies

and is far from ideal, yet man, like all thinking animals, is endowed with such mental qualities by his antecedents and surroundings as to lack the initial force necessary to institute the desired reforms save in response to the stimulus of a social cataclysm, which, at this time seems remote in Canada at least.

As an elementary student, the writer need hardly state in concluding this brief and cursory article that there is no pretence at qualification to pronounce upon any of the questions treated. The literature which covers the field and from which these remarks have been drawn largely, is replete with the required authenticity.

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PROGRESS OF PEPTIC ULCERS

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A. GASTRIC ULCERS

1. *Spontaneous healing*

This may occur with acute ulcers. Frequently at post-mortems one or more superficial cicatrices are found in the stomach; superficial as a rule to the muscular coat. Evidence is conclusive that acute ulcers can heal and for this reason it is never justifiable to undertake operative treatment unless for some *grave* complication.

With chronic ulcers the matter is very different. Clinical evidence is making it increasingly clear that such a lesion will seldom yield to any form of medical treatment. Surgeons meet with large numbers of patients who have had many courses of medical treatment but after each course have had a return of their symptoms. It has been suggested that the ulcer heals between attacks only to recur. This is not the case. If operated upon between attacks (which is what commonly happens in hospital practice) an ulcer will be found, although the patient may be perfectly free of symptoms. *Occasionally* at post-mortems there may be found a large indurated scar involving all the coats of the stomach and perhaps adherent to some surrounding viscus with no evidence of active ulceration. Such is an exception, for it is much more frequent to find no evidence of healing. Even where this fibrous induration is sufficiently extensive to have led to deformity of the stomach, *e.g.*, in pyloric stenosis or hour glass constriction, there is usually an active ulcer present in some portion of the scar. Fibrous deformity of the stomach due to an ulcer which is completely healed is extremely rare.

2. *Perforation*

(*a*) *Acute ulcer*

Perforation of an acute ulcer is very uncommon. Lund reports the case of a boy of 8, who for 1 year before perforation showed symptoms of gastric ulcer, and at operation the perforation of a large indurated ulcer of the lesser curvature was found. The youngest case reported is that of a child of 11 months, but it is not known whether it was acute or chronic.

In 3 years there were 3,761 post-mortems at the London Hospital amongst which were found 42 cases of perforated gastric ulcer; 7 of these cases showed acute ulcers, and of these 6 also had chronic ulcer, and in every case it was the chronic ulcer which had perforated. The sole remaining case was regarded as doubtful (Walton). This affords convincing proof that the perforated gastric ulcer must in every case be regarded as a chronic ulcer, and the adequate treatment for such a condition must therefore be carried out. Perforation usually takes place between 20 and 40.

(*b*) *Chronic ulcer*

This severe complication of gastric ulcer, viz., perforation, is relatively frequent. Paterson gives a percentage perforation of 12.

(*c*) *Non-perforated chronic ulcers*

These are most frequently situated on rhe anterior wall of the stomach, making them more amenable to treatment. It has been shown that there is less movement of the posterior gastric wall and therefore more likelihood of the ulcer becoming adherent, especially to the pancreas. On account of the movement of the anterior wall of the stomach adhesions are less likely to take place. If the ulcer of the posterior wall becomes adherent this prevents perforation. It is spoken of as a penetrating ulcer to distinguish it from one which perforates into the general peritoneal cavity. 90 per cent. of perforations are through the anterior wall, 10 per cent. through the posterior wall. If without adhesions the gastric contents will enter the lesser sac and through the Foramen of Winslow enter the general peritoneal cavity. Occasionally ulcers are adherent to the diaphragm. A case is reported in which an ulcer perforated through the diaphragm into the cavity of the heart; similarly it may perforate the pleura and give rise to an empyema.

For the purpose of treatment, the ulcer either has or has not perforated. When this occurs, the peritoneal cavity is filled with gastric contents.

3. *Haemorrhage*

Haemorrhage is more severe with acute than with chronic ulcers. Chronic ulcer may also be associated with a severe haemorrhage. At London Hospital the death rate among cases complicated with harmorrhage was 12 per cent.

4. *Adhesions*

Adhesions, more common in the posterior wall, frequently result from ulcer.

5. *Pyloric stenosis*

This complication may occur when the ulcer is near the pylorus.

6. *Hour glass stomach*

By this is meant a stomach which has been divided into two parts by a constriction. It is usually caused by cicatrization of an ulcer on the lesser curvature, but it may be due to—

(1) Congenital malformation.
(2) Cicatrization of an ulcer.
(3) Perigastric adhesions.
(4) Corrosive poisoning.
(5) Carcinoma.
(6) The operation of gastrostomy.
(7) The operation of partial gastrectomy.

B. Duodenal Ulcers

Acute:—There is not much certainty concerning the occurrence of these ulcers, but they call only for medical treatment. In connection with burns—these were described by Curling in 1841. He found them in 3.3 per cent. of all cases of burns. Found from 7th to 14th day, probably due to *sepsis*. They are less common now. In 138 cases treated antiseptically there was only 1 case of Duodenal ulcer.

Chronic:—This is one of the commonest lesions of the upper abdomen, and is now regarded as more common than gastric ulcer, Mayo placing the percentage at 73.8. As in the case of the stomach, chronic ulcers are more common in men than in women, and occur chiefly between the ages of 20 and 50. Vomiting occurs in 88 per cent. of cases of gastric ulcer. Unless stenosis be present, it is rare in duodenal ulcer.

FRACTURES OF THE SPINE

J. Harold Couch, B.A. '25

Sir William Osler once said that "system enables one to take the greatest advantage of one's faculties with the least expenditure of energy. For this reason an effort will be made in this article to present the most useful and practical points re spinal injuries in a brief and systematic form, which may serve as a framework on which to build any further study of the subject.

In all matters surgical a study of the anatomy, physiology and pathology of the condition is absolutely essential because with these things clearly understood the further handling of the case becomes a mere matter of applying "surgical judgment", which may be defined as common sense plus experience.

Anatomy.—The vertebral column is a flexible tube which constantly varies in shape with the movements of the body. It is made up of vertebrae which, in themselves, are rigid segments. Each vertebra consists of a body, pedicles and laminae enclosing the vertebral canal, and transverse, articular and spinous processes. Between each vertebra is an intervertebrate fibro-cartilaginous disc. Numerous ligaments joint the vertebrae together, and these, rather than the muscles, give the spine its strength. There are two lines of support through the

vertebral column: (1) the anterior, consisting of the bodies and intervertebral discs; (2) the posterior, consisting of the articular processes. The posterior support is the stronger and more important.

Physiology.—The function of the spinal column is to support the head and trunk, and to contain and protect the spinal cord. Injuries to the spine are immediately serious only in proportion as the cord is damaged.

Pathology.—Injuries consist of (1) a *fracture* through the body of the vertebra without dislocation. In these cases often no fracture or dislocation can be demonstrated, but frequently there has been a dislocation at the time of injury which reduced itself almost immediately; (2) a *fracture-dislocation* which is simply a further degree of the simple fracture. The posterior and anterior longitudinal ligaments, with the spinous muscles, are ruptured and part of the vertebral body slides forward and remains dislocated and readily demonstrable; (3) damage to *spinous processes* and laminae.

Etiology

(1) *Direct violence*, that is a blow or fall directly on the spine. This causes injury to the processes first and may result in them being driven down to cut or press on the cord.

(2) *Indirect violence.*—(*a*) Something falls on the patient. The patient is usually caught in a somewhat plexed position to begin with. The classical example is the coal-miner seated at his work, caught by a slide of roof coal, which doubles him up and forces his head down between his legs. This is by far the commonest type, causing 70 per cent. of all fractured spines. (*b*) The patient falls on something, usually from some height, and lands on his head and shoulders. The process is the same as before.

Practical Classification

(1) *Fractures with cord injuries.*

(2) *Fractures without cord injuries.*

The first group are the classical cases one sees in hospital wards. They are, however, the less interesting. The prognosis is gloomy in the extreme. The second group, however, are the interesting ones for they are more obscure. For them we can do the most, but for them, as a rule, least is done. Properly handled, the results in such cases are most gratifying both from the point of view of the surgeon and of the patient. As they are usually handled, the reverse is true. This is a very important point from a practical standpoint. It has been estimated that about 75 per cent. of fractured spines are not primarily diagnosed as such. It is significant that, of the 25 per cent. which are correctly diagnosed, 85 per cent. have paralysis. This indicates that the popular delusion is that paralysis is necessary to diagnose a fracture of the spine. In fact, some people think that if a man can walk at all he has no fracture, and treat him for sprain or bruise. As a matter of fact paralysis occurs in only about 33 per cent. of fractures of the spine.

These undiagnosed cases result in much unnecessary pain and suffering, and in considerable economic loss to the community. They may go about for years before some one spots them. During this time they go from one doctor to another, suffer a great deal, get little sympathy, and give the profession a black eye.

Diagnosis

Chief Complaint.—90 per cent. have pain in the back, often with referred pain elsewhere. Other things that patients complain of more or less constantly are weakness, from a slight annoying feeling of weakness up to actual paralysis; inability to straighten the back or to lift heavy weights. Not uncommonly the patient has "a weak back ever since I hurt it". If this is his main or only symptom he may get but slight sympathy from any doctor who, finding nothing wrong with him, remembers that some one has classified all people into those with backs and those without.

History.—We look for some form of one of the types of injury above mentioned. Any crushing accident where the patient's head is forced down between his legs should be regarded with much suspicion, and should be treated as fracture of the spine until proven otherwise.

Physical Examination

(1) *Deformity.*—In the normal spine the 7th cervical vertebra is the most prominent, though usually none are markedly prominent. In virtually all cases of fracture, the spines are prominent, which makes it possible to localize the injury without X-ray. The normal spine, laterally viewed, has the head above the sacrum, and there is a concavity in the cervical and lumbar regions compensated by a convexity in the thoracic and sacral. The fractured spine, not uncommonly, has a kyphus which entirely obliterates the normal curves. The centre of gravity is thrown forward and the patient bends his knees to compensate and so keep under his centre of gravity. Viewed from behind the normal spine is straight down between the scapulae and iliac crests. The fractured spine may show some scoliosis, often slight.

(2) *Limitation of Movement.*—The normal spine in flexion forms a perfect curve; care must be taken to see that the head is dropped if the curve is to be perfect for if the head is extended it promptly flattens out part of the back. In extension we can normally swing back 20°-30° in a smooth unbroken curve, while laterally we can bend to either side equally and smoothly to about 45°. The fractured spine may have fair flexion, perhaps almost as good as normal, but the hyperextention is always impossible and the lateral movement is interfered with and usually unsymmetrical.

(3) *Tenderness on Pressure.*—Deep pressure on either side of the fractured vertebrae produces a deep, dull tenderness. This is a valuable sign since it is always present in early cases and in most late cases even many months after the injury. It is, of course, very easy to confuse with tenderness due to sprain or bruising of soft tissues in early cases.

(4) *Paralysis.*—In only one-third of the cases is this present. It is usually bi-lateral, and varies in extent according to the location of the fracture and the extent of cord damage.

(5) *Anaesthesia.*—This is not common either, and, of course, it also varies with the location and extent of the damage. There may be a band of hyperaesthesia above the anaesthesia.

(6) *Reflexes.*—These are disturbed in cases of transverse cord lesions. They all disappear below the injury immediately following it, but in the course of weeks usually return in part if the patient lives. This return is due to establishment of a short reflex, involving only the cord below

the injury and is of a primitive or infantile type, often the so-called "mass reflex".

These last three—paralysis, anaesthesia and reflex change—are evidence of cord injury. They are useful when present in locating accurately the lesion, and they vary widely in the picture presented according to where in the cord the lesion is. Their interpretation depends on a thorough knowledge of the physiology of the nervous system and of the distribution of sensory and motor nerves.

Laboratory Findings.—By this is meant X-ray. Every serious injury to the back should be X-rayed both antero-posteriorly and laterally. The usual finding is the V-shaped crushed vertebral body with kyphosis.

Again we emphasize that about 65 per cent. of fractured spines must be diagnosed without, or in spite of, paralysis, anaesthesia, reflex changes, or X-ray.

Treatment.—In brief and to the point, a fracture of the spine should be treated just the same as any other fracture. The parts are usually in good apposition. This must be maintained. Any deformity, such as kyphosis, must be corrected. A rigid frame does all these things, and also provides for the immobilization so essential to good union in any fracture.

Some men advise operation, but, as a rule, this is not indicated. The only cases where operation is to be considered at all are (1) those where bony splinters are pressing on the cord. These are rare and the results of operation are dubious. (2) Those where the cauda equina alone has been severed. Here we are dealing with a peripheral nerve trunk where regeneration is possible if the ends are sutured. However, one must work at a great depth through a small hole. Statistics are not encouraging. Operation merely adds further trauma to the spine and surrounding tissue, and, what is more important, puts a sore on the patient's back so that he cannot lie on his back on his rigid frame. From both the works of Wallace, who disapproves of operation, and of Mixner, who approved of operation, and their statistics, one is forced to the conclusion that operation is contra-indicated and the treatment is (1) early diagnosis, (2) early immobilization and (3) continued immobilization till union occurs, (4) symptommatic, as for cystitis and bed sores, *i.e.*, in principle, the same as any other fracture.

DIGITALIS IN CHRONIC HEART FAILURE

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There are all degrees of heart failure—from that in which the heart is only embarrassed when it is called upon to do considerable extra work to that where it cannot sufficiently act even when the patient is completely at rest. When a heart fails it is the muscle that is at fault. Lesions of the valves and of the pericardium only are of significance in that they throw more work on the myocardium. As long as the muscle is sound it can stand an enormous amount of extra work without giving way.

Usually in cases of heart failure auricular fibrillation is present and has largely contributed to the embarrassment, but again it may be absent, and a regular heart may fail. Also in failure the rate of the heart is usually increased but occasionally one sees cases where it is not so, and cases occur where the heart is both regular and not hastened.

It is the ventricles which really do the important work of the heart. It is often possible to say which of the ventricles is at fault. When the left is involved acute oedema of the lungs is apt to occur and sudden death is not infrequent. Short of these terminal events, a severe fall in the systolic blood pressure, a galloping rhythm, and *pulsus alternans* are all suggestive of left heart involvement.

When the right ventricle is at fault the onset is usually more gradual and more easily recognized. There is over-filling of the veins with venous engorgement of the various organs, with cyanosis, big liver and scanty urine. Oedema of the dependent parts of the body is present and effusion into the serous cavities may occur.

Very often, however, both ventricles are equally at fault.

Treatment.—This varies according to the degree of failure. In very slight cases of cardiac insufficiency carefully regulated physical exercises will sometimes improve the tone of the muscle and thus increase its efficiency. But when the failure is at all great rest is of the greatest importance and may of itself be sufficient to restore the compensation. The diet varies with the degree of failure. In severe cases it is well to give nothing by the mouth for a day or two, and then the meals should be small and frequent and consist largely of milk. Where oedema is great the total fluids should be restricted and it is wise to give little salt.

Many cases of heart failure when put upon rest and a careful diet regain their compensation, but in most instances the tired myocardium requires further aid, and here digitalis is *the* drug. There are few examples in the whole field of therapeutics of such brilliant results as are obtained when this drug is properly given in suitable cases. It is indicated in all forms of heart failure but it is in those showing cyanosis and oedema that its most striking effects are seen. Most of such cases are examples of auricular fibrillation and we will consider the treatment of such in the first place. The patient has dyspnoea, is oedematous, with enlarged liver and scanty urine. The functions of all the organs are also more or less disturbed owing to venous engorgement. The

pulse is fast and totally irregular and many of the beats do not reach the wrist—in other words, there is a pulse deficit. If such a patient be put at complete rest and on a restricted diet he will probably improve, but this improvement will be much more complete if he be also given digitalis. The B.P. dose of the tincture is 5 to 15 mins. but we generally give much more than this, and it is good practice to begin with 90 minims in the twenty-four hours. By the next day the patient will begin to feel more comfortable, and although the heart rate will not yet have altered more of the beats will be reaching the wrist. Next the heart begins to slow and soon diuresis sets in and the oedema will lessen in proportion to this.

In fibrillation of the auricles the chief way in which digitalis acts is by its producing a degree of heart-block so that the ventricles are spared some of the numerous and irregular impulses that come down from the fibrillating auricles. Some believe that this is the only way in which the drug acts, but others think that the muscle is also directly influenced so that the systoles are more complete. The fact that improvement occurs also in regular hearts and in some cases without any slowing of the rate would seem to point to the latter belief as being the correct one. The digitalis should be continued in the above dose until the true pulse rate is lowered to about seventy per minute. But in many cases before this desired effect has been obtained untoward symptoms set in which necessitate its discontinuance. These are, stomach disturbance as shown by nausea and vomiting, coupled beats from ventricular extra-systoles, a lessening of the urinary flow, and more rarely diarrhoea or cerebral disturbances.

When failure occurs in regular hearts the effects of digitalis are less striking but still sufficient to restore compensation: the oedema lessens, the venous engorgement of the liver and other organs tends to disappear and the patient feels more comfortable. Sometimes the desired diuresis does not set in and then some diuretic should be used in addition to the digitalis. Potassium acetate often is of value, but one of the purin bodies is usually more efficient. Caffeine is usually first tried, or diuretin, which is sodium and theobromine salicylate, and often theocin acts like a charm. This should be given in five grain doses every four hours until forty grains have been used. If it does not act by then no more should be used. Occasionally where the oedema is massive or there is much effusion into one or more of the serous cavities digitalis will not act as a diuretic until much of the fluid has been mechanically removed.

The official preparations of digitalis are few. The tincture is the one most commonly used, but some prefer the leaf itself or the infusion. Guy's Pill, consisting of one grain each of the powdered leaf, squill and blue pill mass, is often valuable, especially in cases with much bronchitis or great venous engorgement of the liver. While digitalis is usually given in the doses mentioned, some use the "massive method". Here very large amounts are given and the effects are more quickly obtained. In Germany enormous amounts used to be employed. And G. W. Balfour in England in 1875 advocated giving as much as 70 minims every four hours in urgent cases. Eggleston in recent years has revived this large dosage and gives as much as .15 c.c. of the tincture per pound weight of the patient, the weight due to the oedema being deducted. It is very seldom in private practice that such doses are required and the

good effects of the drug are just as well obtained by the smaller doses although they take longer to appear.

When in a case first seen the stomach is much disturbed the drug should be more cautiously given and usually the gastric disturbance will soon lessen. It is due to venous engorgement of the stomach wall. Sometimes, however, the stomach will not tolerate even small doses and then the drug may be given at first by the bowel in double doses, or one or two small doses of strophanthin may be used intramuscularly or even intravenously, and then the treatment may be continued *per oram*.

Withering in 1785 wrote of digitalis: "Let the medicine be continued until it acts either on the stomach, kidney, pulse or the bowels; let it be stopped upon the appearance of any one of these effects, and I will maintain that the patient will not suffer from its exhibition nor the practitioner be disappointed in any reasonable expectation." And after a hundred and fifty years, during which foxglove has been constantly used in all parts of the world, these pregnant remarks are as true as when they were written by that wise general practitioner.

GARTH AND THE APOTHECARIES[1]

By a Graduate

Sir Samual Garth (1661-1719) will be remembered more as a poet than as a physician. His best known poem, "The Dispensary", satirizes the quarrel between the physicians and the apothecaries. For several centuries in England the apothecaries had dispensed the prescriptions of the physicians as well as selling drugs to the public. Chaucer, in the *Canterbury Tales*, indicates that the separation between the two groups were practically complete in the 14th century. Speaking of the Doctor, he says:

Full ready had he apothecaries
To send him drugs and lectuaries.

There was a bond, however, between them.

For each of them made other to winne
Their friendship was not new to beginne.

(Fee-splitting, after all, is evidently not a twentieth century innovation.)

In 1617 the Apothecaries Company was established by law, giving the Apothecaries the privilege of dispensing and selling drugs. For nine years previous "an unnatural and unholy alliance" had existed between them and the grocers (and pepperers), the latter importing from the East drugs as well as spices. This nine years of fighting made the apothecaries rather aggressive—rather spoiling for a fight. A *causus belli* was soon discovered. The apothecaries were treating patients. "The doctors of that day knew so little that the apothecaries found it easy to know as much." The apothecaries often consulted the prominent physicians about their patients and that "added fat to the fire". The consultations usually took place at the coffee houses. For example, Mead, the fashionable doctor of his day, could be consulted at Batson's Coffee House in the morning and at Tom's Coffee House at night.

[1]Read at the Medical History Club of London, April, 1924.

He charged the apothecaries half a guinea for a prescription instead of a guinea, the regular fee to a patient. Rivalry for patients between the physicians and apothecaries, rivalry between the consultants and the apothecaries, was the inevitable result.

With the hope of lessening the popularity of the apothecaries the College of Physicians in 1667 required its members to give advice to the poor, gratis. This helped the poor very little because they were still at the mercy of the apothecaries, who filled the prescriptions given them by the physicians. The apothecaries' charges were by no means small, partly because the ingredients of a prescription were many and most diverse. The witches of Macbeth may have borrowed their recipe from a prescription book of those days, when animals and their excreta were essential parts of the *materia medica*.

Round about the cauldron go;
In the poisoned entrails throw,
. . . . . .
Fillet of a fenny snake
. . . . . .
Eye of newt and toe of frog,
Wool of fat and tongue of dog,
Adder's fork and blind-worm's sting,
Lizard's leg and owlet's wing.

(Our polyglandular organo-therapeutists might be able to give a pseudo-scientific explanation of the efficacy of such a mixture.)

Garth, in *The Dispensary*, describes the interior of an apothecary shop thus:

Here, Mummies lay most reverently state,
And there, the Tortois hung her Coat o' Mail;
Not far from some huge Shark's devouring head
The flying Fish their finny Pinions spread.
Aloft in Rows large Poppy Heads were strung,
And near, a scaly Alligator hung.
In this place, Drugs in musty Heaps decay'd,
In that, dri'd Bladders and drawn Teeth were laid.

In 1696 the College played their last card in an effort to beat the apothecaries. A Dispensary was opened in the College building where

A Golden Globe plac'd high with artful skill,
Seems, to the distant Sight, a gilded Pill.

The poor were supplied with advice gratis and medicines at cost. The battle began in dead earnest. A paper warfare developed—handbills, pamphlets, books, all bristling with invective, innuendo, sarcasm, personalities and humour—the latter supplied chiefly by Garth. "A squabble as disreputable as any embalmed in the literature."

The educated classes for the most part sided with the physicians or dispensarians, as they were called. Dryden, the poet, had this to say about the apothecaries:

From files, a random recipe take
And many deaths of one prescription make.

Neither did he have unbounded confidence in the medical profession.

He 'scapes the best who nature to repair
Draws physic from fields in draughts of vital air.

(Fresh air and heliotherapy evidently were appreciated even in Dryden's day.)

Pope, partly through friendship for Garth, took sides with the physicians and expressed his sympathetic attitude towards them in these lines:

God and the doctor we alike adore,
But only when in danger, not before.
The danger o'er, the both are alike requited.
God is forgotten and the doctor slighted.

The Dispensary

Of all the participants in this warfare of words, Garth gave the most effectual blows because of his ready wit and facile pen. He broke into poetry just as naturally as a child breaks out with measles—but this is a dangerous experiment, especially for a young practitioner. He took the precaution, however, to publish his poem, *The Dispensary*, anonymously, and in a loose paper form. Its instant popularity made it safe for Garth to issue a second edition in book form. A third edition was required during the first year of its publication. Ten editions finally came from the press. (The fourth edition, published in 1700, does not carry Garth's name on the title page.) Its success may be explained in part by the fact that Garth made use of a well-known psychological law—the public loves mystery. He stimulated their curiosity by figuring many prominent personages either under fictitious names or with their actual names feebly masked by hyphenating the consonants.

The quarrel occupies the first five cantos and to be appreciated should be read. In the sixth Canto,

Auspicious Health appear'd on Zephyr's wings,

who suggests that Hygeia guide Celsus (Garth's pseudonym—I had one of those things myself when I wrote on the exams some quarter of a century ago)—to the lower regions to consult the immortal Harvey. The suggested is acted upon and Garth's description of the infernal regions reminds one of Dante's Inferno.

Relentless Febris . . . Hydrops bloated and big . . .
Loathsome Lepra . . . meager Phthisis . . . and
Behind stood Crowds of much inferior Name,
Too numerous to repeat, too foul to name.

The Stygian Pilot received the deputation with smiles and assured them that physicians needed no passport there, for

Our awful Monarch and his Consort owe
To them the peopling of their Realms below.

The venerable Harvey deplores the dissention in "the Faculty":

Where sick'ning Physic hangs her pensive Head
And what was once a Science now's a Trade.

He advises them to forgive and forget

And sove'reignly restore
Your Science to the height it had before.

To the present generation of physicians this poem will always be of interest because it commemorates the first attempt to establish an outdoor department for the treatment of the poor.

SOME POINTS ON NOTE-TAKING

R. P. Mackay, B.A. '25

(This short article on note-taking is written in the hope that it may prove somewhat of an aid to those who are now for the first time haunting medical lecture halls. "A word to the wise. . . .")

To emphasize the necessity for note-taking is to employ oneself at a superfluous task, for whether or not the medical student in his first days as undergraduate recognizes it, he will soon confess that notes are indispensable. They are as inevitably a part of his education, whether professional or not, as are books and lectures, and it is a safe assertion that students (of medicine, at least) spend more time at their notes than they do at their books. Since note-taking and note-reading are to fill so important a place in the intellectual life of the student, it behooves him to take care that he forms good note-taking habits. For if notes are carefully and efficiently made, many a weary hour of toil into the night will be spared him, and the black cloud of examinations will not so completely darken his sky.

Notes, to the student, serve a threefold purpose. They increase, in the first place, the emphasis of the words of the lecturer. To the impression made by the sound of the speakers' voice is added that made by thinking the matter over and writing down the outstanding ideas. In the next place, notes are an invaluable guide to review. In a set of notes one has not only the ideas recorded, but these ideas serve as effective finger-posts, directing the path of the student through further reading on the subject. And finally, the medical student has a professional interest in his notes. If some of the notes he makes are of temporary interest only, others will have value for years.

What, then, are the attributes of good notes, well taken? What should be the aim in taking notes?

They must be brief: the crush of examination time will not permit the perusal of reams of notes, and even though the time allowed of it, such notes would leave unemphasized the important points of the subject. Who can distinguish the keynote ideas of a lecture when they are submerged in a welter of illustrative and unessential detail? But, though brief, notes must be full enough not to leave out half that is said. A few mere catch words, perfectly intelligible a day after the lecture, become a meaningless mess six months after, with no cohesion to hold it together.

If notes, then, must be brief, but not too brief, the solution comes through making them discriminately emphatic. It is essential that one train himself to catch the headline points of a lectures and, while listening to the detail and repetitions, set down on paper only the rough framework. Lectures differ widely, in that some are all framework and no detail (these have usually been compacted from books) and hence are very difficult to make notes upon, while others are all detail and no framework (probably the worse of the two types). An ideal lecture is one orderly arranged in a reasonable fashion, with nodal points standing out above the emphasizing and illustrative material. To take useful

notes, one must study his lecturers as he would the moves of an opposing rugby team.

An example of a good method of making notes may with profit be given here. Let us suppose that the subject be "fractures". Notes on such a lecture might be begun as follows:

FRACTURES

I. Cause.
  A. External violence.
    1. Direct—the blow falls on the bone directly.
    2. Indirect—the bone, subjected to strain, breaks at its weakest point. Types are:
      (*a*) Flexion, or bending of bone.
      (*b*) Torsion or twisting of bone.
      (*c*) Crushing of one part of bone by another.
      (*d*) Pulling apart of bone by tendons, etc.
  B. Inner bone defect.
    1. Atrophy of bone.
    2. Ricketts.
    3. Osteomalacia, etc.
II. Varieties of fractures.
  A. Simple—soft tissues not opened to outside.
  B. Compound—soft tissues are so opened.

It is unnecessary to carry the illustration further since sufficient is given to show the method. This, while not the only efficient method of note-taking, has the advantages of brevity, discriminating emphasis, and logical system. One may review such notes as quickly or as carefully as he wishes, depending on how thoroughly he goes into them.

A valuable additional aid is the use of underlining with red ink. Many students find two fountain pens, one for red and one for blue ink, of great value. Nodal points may thus be additionally emphasized—but a too liberal use of underscoring destroys the emphasis, and hence should be avoided.

Finally, when notes are taken, the battle is only half won; they must be properly used. A few pointers as to methods found useful to others may serve well here.

Psychological experiments show that material that has been read or heard is forgotten faster just after the impression than at any other time. More of a lecture heard is forgotten in the first day or so than in all the other time that elapses, say, before examinations. This is abundantly supported by the experience of students, that a review of one's notes shortly after making them aids greatly in fixing the material permanently in mind. The best time for this immediate review is each evening, when the notes for the day can be gone over carefully, and checked or corrected. Though seeming tiresome at first (a "rehash" of anything is always tiresome) such an exercise abundantly repays in the end. Notes may with profit be read on two or three successive evenings, and with very little trouble.

Then one never gets full value from his notes unless he uses them as a guide to reading. If he takes his notes, say, on a lecture on fractures, and reads on the subject in his surgery text, he has fresh before his

mind the words of the lecturer, the notes he has made, and the material in the text-book, and the three can be compared and easily summarized.

Care spent on notes is care well spent, for it saves time and effort over and over again. One final word may not be amiss: Legibility is the queen of all student virtues, and illegibility the most inexcusable of vices. "What boots it with incessant care" to jot one note upon another, if they never can be read?

STANDARDS OF DIAGNOSIS AND TREATMENT OF TUBERCULOUS CERVICAL ADENITES

(From American Review of Tuberculosis, Nov., 1918)

(These standards have been prepared by two committees of the National Tuberculosis Association of the United States. Their aim is to assist the physician in the diagnosis of obscure tuberculous lesions. The standards have been previously issued in a pamphlet by The Community Health and Tuberculosis Demonstration of the National Tuberculosis Association, Framingham, Mass.)

1. *Enlargement of the cervical glands.* From the clinical point of view cervical glands should not be considered pathologically enlarged unless they can be easily seen or felt. The small node-like enlargements without symptoms frequently found in children, which remain for varying periods, should not be so considered. Glands of larger size should receive serious attention. Enlarged cervical glands in children under two years of age are usually due to some acute inflammatory process rather than to tuberculosis.

Any well marked enlargement of the anterior cervical glands that persists for several months after throat and mouth infections have been relieved should be considered tuberculous.

2. *Exposure.* When the cervical glands are found to be enlarged, according to the above standards, in children or adults in whom there has been known exposure to tuberculosis from human or bovine sources, tuberculosis as a cause of such enlargement should be seriously considered. Such exposure as this, however, does not constitute absolute proof that the glands are tuberculous.

3. *Other causes of enlarged cervical glands.* Enlargement of the cervical glands may take place following or during the acute infectious diseases of childhood, and also following acute and chronic tonsil infections, pharyngitis, carious teeth, leukemia, Hodgkin's disease, syphilis, middle ear diseases, eczema, mycosis, or irritation of the ear and scalp, etc. Enlarged glands posterior to the sternocleidomastoid muscle are usually non-tuberculous, especially in children.

4. *Constitutional signs and symptoms when the cervical glands are enlarged.* When the cervical glands are enlarged as defined above, and particularly when the patient is obviously below par in strength, endurance, and size and is suffering from certain constitutional signs and symptoms, such as anaemia, malnutrition, fever, rapid pulse, loss of weight and strength, as defined in the preceding pages, tuberculosis

should be seriously considered as a possible cause of enlargement of such glands.

5. *Duration of enlarged glands.* As a general rule, tuberculosis should not be considered to be the cause of cervical gland enlargement unless the enlargement persists for several months. It is a safe rule in children to consider any gland tuberculous that has been enlarged for three months or more following the elimination of other obviously possible causes, such as diseased tonsils, carious teeth, etc. Under these circumstances it is wise to treat the gland as tuberculous.

6. *The relation of diseased tonsils and carious teeth to enlarged cervical glands.* In any case of enlarged cervical glands, diseased tonsils or adenoids should be removed, and carious teeth treated or removed. While tuberculous as a cause of the enlargement of such glands cannot be ruled out, even in the presence of evident focal infection as diseased tonsils or adenoids and carious teeth, it is better to take it for granted that such glands are not tuberculous until the effect of the removal of tonsils and adenoids and cleaning up the teeth has been observed. If, in spite of the removal of such foci of infection, the glands still remain enlarged, it is fairly conclusive evidence that the enlargement is due to tuberculosis.

7. *Pathological examination.* In a case where there is any doubt as to the diagnosis it is better, particularly in adults, to remove a gland and submit it to a pathological examination to determine the exact nature of the enlargement. Tonsils and adenoids that have been removed should be examined for tuberculosis histologically and by animal inoculation. If these are found to be tuberculous it is wise to conclude that the enlarged glands are likewise tuberculous.

8. *Confirmatory evidence.* Confirmatory evidence may be secured through the tuberculin skin test and the X-ray and is, of course, to be found in manifest tuberculous conditions in other parts of the body.

The Treatment of Tuberculous Cervical Adenitis

1. Tuberculous cervical adenitis should always be treated as a general disease with local manifestations.

2. All possible portals of entry of infection, such as teeth, nasopharynx, tonsils, infections of the ear and scalp, etc., should be examined and treated.

3. There is no short road in the treatment of cervical adenitis. All of the methods of treatment should be carefully considered, in each individual case and whatever line of treatment is instituted, hygiene should play a most important part.

4. Tuberculin, surgery, heliotherapy, and X-ray may be valuable in the treatment of tuberculous cervical adenitis when associated with hygienic treatment. No one method of treatment should be used to the exclusion of others. Do not treat the "lumps in the neck", but treat each individual case as it presents itself, using any or all of the above methods to accomplish the desired results.

A PHOTOSYNTHETIC COMEDY

DR. EDWIN E. SLOSSON
Director, Science Service, Washington, D.C.

As I was passing a florist's shop-window not long ago I saw a little image of a man's head in porous brown pottery, and on the top of it instead of hair there was a fine growth of grass, rising straight and thick from the forehead like Senator La Follette's hair. It occurred to me at once that this was a bright idea. For what good is hair anyhow? You can't pasture sheep on it, and you have to pay a barber to run a lawn mower over it and then he does not allow you anything for the crop. Now if we could grow grass instead it would cover the head quite as completely, and look as well—after we got used to the colour—and, what further appealed to me, when the sod got thin the surface could be reseeded.

As I walked on the idea sank deeper into my brain. Would it not be possible that the grass growing on one's head might send down through its roots a constant supply of proteins, fats, carbohydrates and vitamins in the proper assortment so as to do away with the necessity of food? For it has always seemed to me an humiliating necessity, unworthy the dignity of man, that he should have to be dependent upon the plants for the fixation of solar energy that supplied his motive power. Just for lack of a little chlorophyl must man remain forever a parasite on plants? If man only had a head as good as a cabbage he could accomplish the process of photosynthesis for himself.

Or, if man could not acquire the necessary chlorophyl, could he not form a close combination with some sort of plant life that possessed this power, as by farming out on shares any waste land he might have on his head? On looking up the matter I found, as I often do, that my idea was not so original as I supposed. I had, in fact, been anticipated by a million years or so, for certain sea creatures and land fungi, which, like man, were devoid of chlorophyl, had incorporated green vegetation which fed them the solar energy that they could not secure for themselves. The lichens have carried on such a partnership between plant and fungi for untold ages. The botanists call it "symbiosis", probably to avoid the commercial taint of the word "partnership".

But even though I had been beaten to it by the lichen it did not appear that anybody had got a patent on symbiosis as applied to man. So I set about figuring out the acreage necessary for a home-grown dietary. I drew the outline of my hat band on a sheet of paper and laid it off in centimeter squares with a ruler. The area added up to 260 square centimeters. I sent this figure to a friend of mine who knows more about the value of solar radiation than anybody else, and asked him how many hours I would have to sit out in the sun to receive enough energy to equal what I now take in as food. My dietary I figured as roughly 3000 calories a day on the average, including a rather hearty Sunday dinner.

He wrote back that I would have to have more of a swelled head than I had already to carry out the scheme. I did not understand what he meant at first, but on going over his figures I saw the difficulty. One

square centimeter of the earth's surface at the equator receives from the sun, or would receive if there were no clouds or atmosphere, .00194 calories a minute. At the latitude of Washington and sea level a square centimeter receives in the course of a year only about 152 calories. Accordingly the solar expert to whom I referred the question concludes:

"For your requirements of approximately a million calories a year, the diameter of your head would have to be increased between five and six fold, in order to receive enough energy from the sun to sustain your mental and physical operations, and you would have to sit out in the sun all day long, every day in the year. These figures take account of the losses in the atmosphere and the obliquity of the rays, so you could hold your head up straight and not have to turn it around like a sunflower, as you suggest."

I do not easily give up an idea, so I measured my back and calculated its area, only to find that this, however well sodded, would not be a third large enough. Worse still, I found that the green leaves are shockingly inefficient transformers of energy. They store up in the form of combustible or edible products only about one per cent. of the radiant energy they get from the sunshine. It would then take some three hundred mossbacks, working full time, to provide my necessary nutriment.

So I have been forced to admit that my scheme is impracticable, at least in its original form, but my figuring has the stronger confirmed my belief that some way might be found to make use of solar radiation for human purposes, without wasting more than ninety-nine per cent. of it, as is done by employing plants as intermediaries. An area of twenty square feet in latitude 38 degrees and at sea level receives energy enough through the year, counting all the days as sunny, to give one horse-power continuously. If the weather is half cloudy forty square feet would amount to one horse-power. This means that taking the country through each acre of land is getting more than a thousand horse-power, and each square mile more than a half a million horse-power of free energy from the sun, and yet we make no use of it except such infinitesimal fraction as may be converted into food or fuel by vegetation, or may raise water to the clouds to come down as rain and perchance to be caught by a water-mill, or may stir up the atmosphere to be used in running a few scattered windmills. It does seem to me that we might use a little more of this wasted wealth than we do. But the problem is too big for my head to solve.

THE EARLY MORNING KISS IS THE MOST DANGEROUS

Etiological Studies in Tuberculosis

The dust of rooms in Trudeau Sanatorium, in rooms occupied by patients discharging tubercle bacilli, in two rooms previously occupied by patients long since dead, and dust from the mouthpiece of the telephone used in common by patients at Trudeau Sanatorium, was examined by washing and centrifugalization, followed by staining of the direct smear and guinea pig inoculation. No tubercle bacilli were found. Similar dust was drawn by vacuum cleaner through a box containing guinea pigs. These were not infected.

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Eating utensils were examined immediately after use by patients with positive sputum. Spoons, forks, glasses and cups were contaminated. Knives and plates were not. Ordinary washing and rinsing in very hot water was sufficient to sterilize these utensils.

After a patient with tubercle bacilli had coughed on his hands, tubercle bacilli were recovered from the wash water, but not from the hands of a second person with whom he shook hands, or from a doorknob which he seized.

Tubercle bacilli could readily be found in the saliva of patients with positive sputum. When these patients kissed petri dishes immediately after, and ten minutes after cough, tubercle bacilli were recovered from the dishes. Twenty minutes after cough no bacilli were found. The early morning kiss was the most dangerous.

Tooth brushes of patients with positive sputum always contained tubercle bacilli.

Flies were shown to be capable of carrying the germ but did not infect guinea pigs in the same cage.

Lawrason Brown, Petroff, and Pesquara in Studies of the Edward L. Trudeau Foundation, 1919.

NOTES AND COMMENTS

Medical Society Appointments

The following appointments have been made by the Medical Society executive:

Medical "At Home" Committee—Nelson Henderson, Chairman; H. H. Hyland, Secretary-Treasurer; W. A. Dinwoody, T. H. Belt, L. C. Eckert, J. Lind.

Daffydil Committee—W. B. Brebner, Chairman; A. D. Kelly, Secretary; Chas. R. May, Treasurer; P. Vivien, Stage Manager; H. Waddington, Property Manager; E. B. Patterson, '27; O. A. Kilpatrick, '28; M. J. Kelly, '29.

Graduation Dance

The Sixth Year are holding their graduation dance on Friday, November 28, at Jenkin's Art Galleries. This dance, which ranks next to the Medical "At Home" in popularity, is assured of being a success under the capable management of the final year executive. Jardine's orchestra will be in attendance, and plenty of novelties are to be introduced. These attractions, combined with an excellent "sit-down" supper, make the affair worthy of a capacity attendance.

Open Society Meetings

The first open meeting of the Medical Society will take place about the middle of November. A capable speaker will be procured for the occasion. Watch "The Varsity" for the date and other particulars.

Dollar Dances

The well-known Medical Society "Dollar Dances" will begin again on Saturday, November 8, at U.T.S. Owing to difficulties in procuring the Hall, these dances can not take place as frequently as in the past, and it is expected

that many students will avail themselves of each opportunity. A good orchestra has been secured.

Medical Women's Dance — The Medical Women's Athletic Association are having a dance at the Lillian Massey Hall on November 1.

Medical Field Day — On October 3 the third annual field day was held at the Varsity Stadium. Excellent weather, a good attendance of students, and a generous representation of the staff graced the occasion. Competition was keen, and several new records were established. Jack Naden, of 2T5, carried off the premier honours for the third (and last) time, with Miller, of 2T6, a close second. 2T6 again won the cup for the largest number of points.

Medical Rugby — The Junior and Senior Rugby teams have got under way under the capable management of Al. Young and Nelles Silverthorne, respectively. In their opening game, Senior Meds. decisively defeated a strong School team by the score of 10-1, and are making a bold bid for the premier honours.

Medical Soccer — The Medical Soccer team made a spectacular start, defeating School 4-1 in the opening game, and Victoria by the close score of 1-0, in the second game, and show promise of repeating their performance on other occasions.

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Every student in the University, members of the medical faculty and practitioners generally are invited to visit the Medical Room at our store, where a carefully selected and up-to-date stock of all medical publishers' books are to be found. There is no charge for the use of the Library—come when you feel so inclined and use these books freely.

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